

I/WE CLAIM:

- Sub 917
1. A washing machine for laundering articles of clothing comprising:
a cabinet shell;
an outer tub mounted within the cabinet shell;
an inner tub mounted within the outer tub for rotation during predetermined intervals in an overall clothes washing operation; and
a noise reduction system for the washing machine, said noise reduction system including a microphone for audibly sensing at least one of unbalance and pump starving conditions, and an electronic controller for altering the washing operation based on signals received from the microphone.
 2. The washing machine according to claim 1, wherein said microphone is mounted on the outer tub.
 3. The washing machine according to claim 1, wherein said inner tub is mounted for rotation about a substantially horizontal axis.
 4. The washing machine according to claim 1, wherein the controller is adapted to detect a microphone signal corresponding to sensing noise caused by an unbalanced condition.
 5. The washing machine according to claim 1, wherein said electronic controller further comprises:
means for varying the rotational speed of the inner tub over a range of speeds; and

means for determining which speeds in the range of speeds results in an optimum level of noise.

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6. The washing machine according to claim 1, further comprising:
a pump and wherein the controller is adapted to detect a microphone signal corresponding to sensing noise caused by starvation of the pump.
 7. The washing machine according to claim 6, wherein said noise reduction system further comprises means for turning said pump off upon sensing pump starving conditions and means for turning said pump on upon sensing that the inner tub is contacting water collected in the outer tub.
 8. The washing machine according to claim 1, further comprising:
a control system for establishing the washing operation for the washing machine based on voice commands sensed by the microphone.
 9. A method of controlling a washing operation of a clothes washing machine including a rotatable tub and at least one pump comprising:
using a microphone to sense noise during operation of the washing machine;
providing signals to an electronic controller corresponding to the sensed noise; and
altering the washing operation of the washing machine through an electronic controller based on the sensed noise.

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10. The method according to claim 9, further comprising:
determining an out of balance condition from the signals provided to the controller from the microphone.
11. The method according to claim 9, further comprising:
varying a rotational speed of the tub over a range of speeds to determine a speed which exhibits optimum noise level as sensed by the microphone.
12. The method according to claim 9, further comprising:
sensing a starvation condition of the at least one pump from the signals provided to the controller from the microphone.
13. The method according to claim 12, further comprising:
stopping the pump upon sensing the starvation condition.
14. The method according to claim 13, further comprising:
sensing that fluid in the washing machine is contacting the rotatable tub; and
restarting the pump when the fluid is contacting the rotatable tub.
15. The method according to claim 9, further comprising:
establishing the washing operation based on voice commands sensed by the microphone.

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